

Date: Monday, 10/16/2006 10:31:50 AM  
 User: Kim Johnston

## Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: 407 HIGH AFT X-TUBE ASSEMBLY
Job Number	: 28983	Part Number	: D407667205
Estimate Number	: 10528	Drawing Number	: D407-667-245 REV <i>PH 07.02.17 ECU 915</i>
P.O. Number	:	Project Number	: N/A
This Issue	: 10/16/2006 S.O. No. :	Drawing Revision	: <i>8</i>
Prsht Rev.	: NC	Material	:
First Issue	: 11 Type : LANDING GEAR	Due Date	: 11/8/2006 Qty: 1 Um: Each
Previous Run	: 26323		
Written By	: <i>HJ 061016</i>		
Checked & Approved By	:		
Comment	: Est Rev: C 05.09.02 Add holes for compatibility with Bell Skid tubes KJ/JLM		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D407-667-205 *CHG003*
*CHG 004 PH 07.02.17 per ECU 915*

2.0	D6011115	Crosstube Material
-----	----------	--------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty	Part number	Description	Batch
1	D6011-115	Crosstube	<i>B195100</i>

Check OD = 2.750"; ID = 1.450"

*MS 06110119*

3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand &amp; install plugs DT8531 on both ends as per Folio FA248

2-Turn first side as per Folio FA248

3-Deburr &amp; Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245.

*MS 06110120*

4.0	QC1	INSPECT ALL DIM TO DIM SHEET
-----	-----	------------------------------



Comment: INSPECT ALL DIM TO DIM SHEET

*MS 06110120*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 10/16/2006 10:31:51 AM  
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Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 407 HIGH AFT X-TUBE ASSEMBLY

Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA248

2-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

3-Polish entire outside surface of crosstube

JD/ST. 6-12-11 (1)

4-Remove sand and plugs

5-Scribe part # and batch # using vibrating stylus as per Dwg D407-667-245

Inside of Cuff(Donot engrave on outside of tube)

MS 06/10/20

6.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

MS 06/10/20

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

MS 06/12/11

8.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

Ensure no sand is in the tube before alodine.

DP/JD

6/12/12 (1)

9.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and.Folio FT

DP  
7-2-5

10.0

QC6

DIMENSIONAL CHECK



Comment: DIMENSIONAL CHECK

10/07/05

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description:

11.0

• LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

85  
07-02-05

DP/M 07-02-05

12.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

DP/M 07-02-06

13.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

14.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

15.0

OUTSIDE SERVICE

OUTSIDE SERVICES



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038Or

Issue P/O: 3096 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

C67102106 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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## Process Sheet

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Drawing Name: 407 HIGH AFT X-TUBE ASSEMBLY

Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

16.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

*Boyer 10/20/06*

17.0

QC6

DIMENSIONAL CHECK



Comment: Inspect for damage & ensure results are as per Dwg D407-667-245

*For 02-12*

18.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

*ml 07 02 12*

①

2-Paint outside crosstube with White Imron as per QSI 005 4.2

*ml 07 02 12*

①

19.0

QC14

Inspect Spray Paint



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

*IT 07-02-13*

20.0

D2856400

Abrasion Strip



Comment: Qty.: 1.3524 f(s)/Unit Total : 1.3524 f(s)

Pick:

Qty Part number Description Batch

2 D2856-400(Cut to 7.73") Abrasion Strip

Batch

*B29285*

*IT 07-02-13*

21.0

D2856600

Abrasion Strip



Comment: Qty.: 0.7445 f(s)/Unit Total : 0.7445 f(s)

Pick:

Qty Part number Description Batch

1 D2856-600(8.510") Abrasion Strip

*Magnabond IT 07-02-13*  
*8 M102437*

22.0

D2873043

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-043

Nut Plate

*28387*

*IT 07-02-13*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

23.0

D2873045

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description Batch

2 D2873-045

Nut Plate

B29107

25-07-02-13

24.0

D28941

2.750 Support



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number

Description Batch

1 D2894-1

Support

19163

25 07-02-13

25.0

D31901

Chafing Shield



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description Batch

2 D3190-1

Chafing Shield

28998

25 07-02-13

26.0

MS20601AD4W8



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number

Description Batch

14 MS20601AD4W8

Rivet

100771

25 07-02-13

27.0

MS2192022

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number

Description Batch

4 MS21920-22

Clamp

M162389

25 07-02-13

28.0

MS2192024

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description Batch

2 MS21920-24

Clamp

M102932

25 07-02-13

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Drawing Name: 407 HIGH AFT X-TUBE ASSEMBLY

Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

29.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note:

(3) top holes should be facing up.

2-Install supports and clamps as per Dwg D407-667-245. Torque clamps to 80-100 in lb

3-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

7-02-13  
POSITIVE RECALL

EFFECTIVE 02.01.02 AUTH PH

RELEASED 07.01.14 DATE PH

30.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

31.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

32.0

AN534A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Bolt

Batch: M101370 - ✓

33.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Nut

Batch: M100564 - ✓

34.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total: 10.0000 Each(s)

Pick: Packing Kit

Qty Part number

10 AN5-10A

Description Batch

Bolt M102083 - ✓

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 10/16/2006 10:31:52 AM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 407 HIGH AFT X-TUBE ASSEMBLY

Job Number: 28983

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

35.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 AN5-32A

Bolt

114981



36.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total: 18.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

18 AN960JD516

Washer

M102929



07/2/14 (1)

37.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

07/02/14 (1)

38.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D407-667-205

Location:

PPP Rev:

B 07/2/14

ATTN  
NEW CHG# Ensure 9365 is attached

39.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



U 07-02-14

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 28983
<b>Description:</b> Crosstube Assembly		<b>Part Number:</b> D407-667-245
<b>Inspection Dwg:</b> D407-667-245 <b>Rev:</b> C		<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

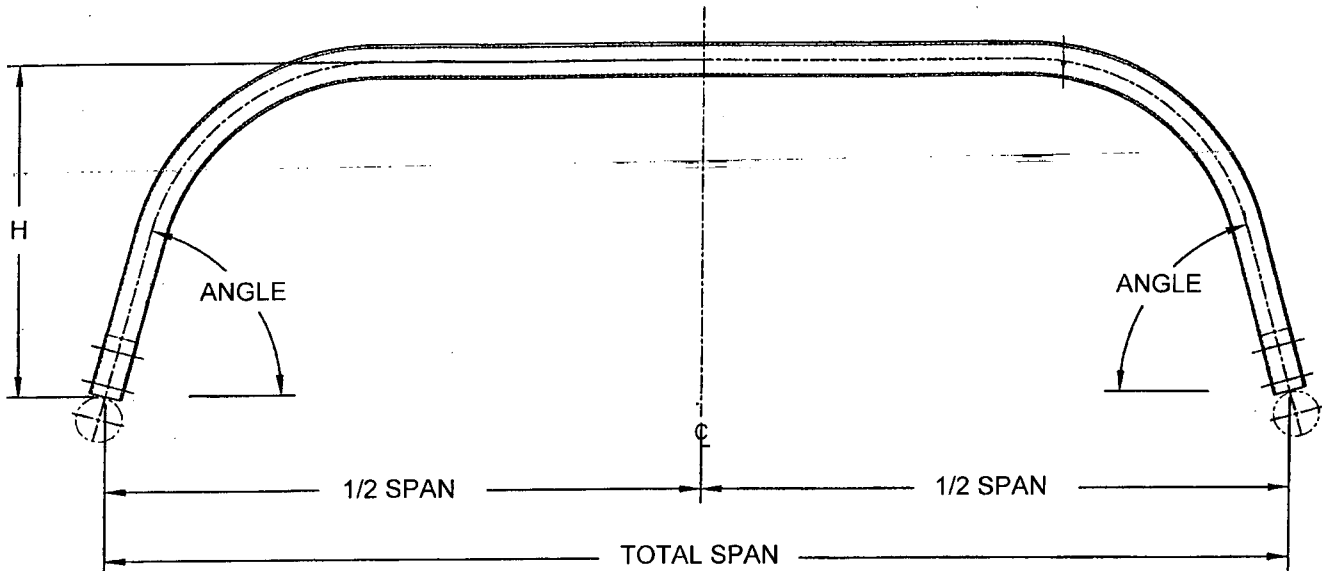
☒ First Article
 ☐ Prototype

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.493	✓			
	1.832	+0.005/-0.000	1.836	✓			
	1.838	+0.005/-0.000	1.842	✓			
	1.892	+0.005/-0.000	1.893	✓			
	2.052	+0.005/-0.000	2.055	✓			
	2.206	+0.005/-0.000	2.209	✓			
	2.521	+0.005/-0.000	2.525	✓			
	2.633	+0.005/-0.000	2.637	✓			
	4.10	+/-0.030	4.10	✓			
	4.978	+/-0.030	4.982	✓			
	2.040	+0.000/-0.010	2.032	✓			
	0.125	+/-0.010	.125	✓			
	R0.063	+/-0.010	.063	✓			
	R0.500	+/-0.010	.500	✓			
SIDE B	2.490	+0.005/-0.000	2.494	✓			
	1.832	+0.005/-0.000	1.836	✓			
	1.838	+0.005/-0.000	1.842	✓			
	1.892	+0.005/-0.000	1.896	✓			
	2.052	+0.005/-0.000	2.056	✓			
	2.206	+0.005/-0.000	2.210	✓			
	2.521	+0.005/-0.000	2.525	✓			
	2.633	+0.005/-0.000	2.636	✓			
	4.10	+/-0.030	4.10	✓			
	4.978	+/-0.030	4.978	✓			
	2.040	+0.000/-0.010	2.032	✓			
	0.125	+/-0.010	.125	✓			
	R0.063	+/-0.010	.063	✓			
	R0.500	+/-0.010	.500	✓			
	112.91	+/-0.020	112.91	✓			

<b>Measured by:</b> MS	<b>Audited by:</b> [Signature]	<b>Prototype Approval:</b> N/A
<b>Date:</b> 06/10/20	<b>Date:</b> 06/12/11	<b>Date:</b> N/A

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM [Signature]	[Signature]

## Crosstube Bend Dimension Sheet



PART NUMBER: \_\_\_\_\_

BATCH NUMBER: 28983

DRAWING: \_\_\_\_\_ REVISION: \_\_\_\_\_

H: \_\_\_\_\_

1/2 SPAN: \_\_\_\_\_

TOTAL SPAN: \_\_\_\_\_

ANGLE: \_\_\_\_\_

QC 15: \_\_\_\_\_

DATE: \_\_\_\_\_

QTY: \_\_\_\_\_





DESIGN PH	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED DS	DRAWING NO. D407-667-245	REV. C SHEET 1 OF 3
DATE 05.07.26		TITLE CROSSTUBE ASS'Y (407 HIGH AFT) SCALE NTS	
A	02.05.13	NEW ISSUE	
B	03.05.21	ADD CHAFING SHIELD	
C	05.07.26	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	

Qty	Part Number	Description
X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	D6011-115	CROSSTUBE
2	D2856-400-773	ABRASION STRIP
1	D2856-600-851	ABRASION STRIP
2	D2873-043	NUT PLATE
2	D2873-045	NUT PLATE
1	D2894-1	SUPPORT
2	D3190-1	CHAFING SHIELD
14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
4	MS21920-22	CLAMP
2	MS21920-24	CLAMP

#### GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6011-115  
FINISHED LENGTH = 112.91±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-773 / D2856-600-851 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2894-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT (OPTIONAL).
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.
- 13) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.

UNDER REVIEW

06.06.23 CB

update dwg  
continue mfg

OK 05.10.16  
PLG

UNDER REVIEW

06.08.10/PA

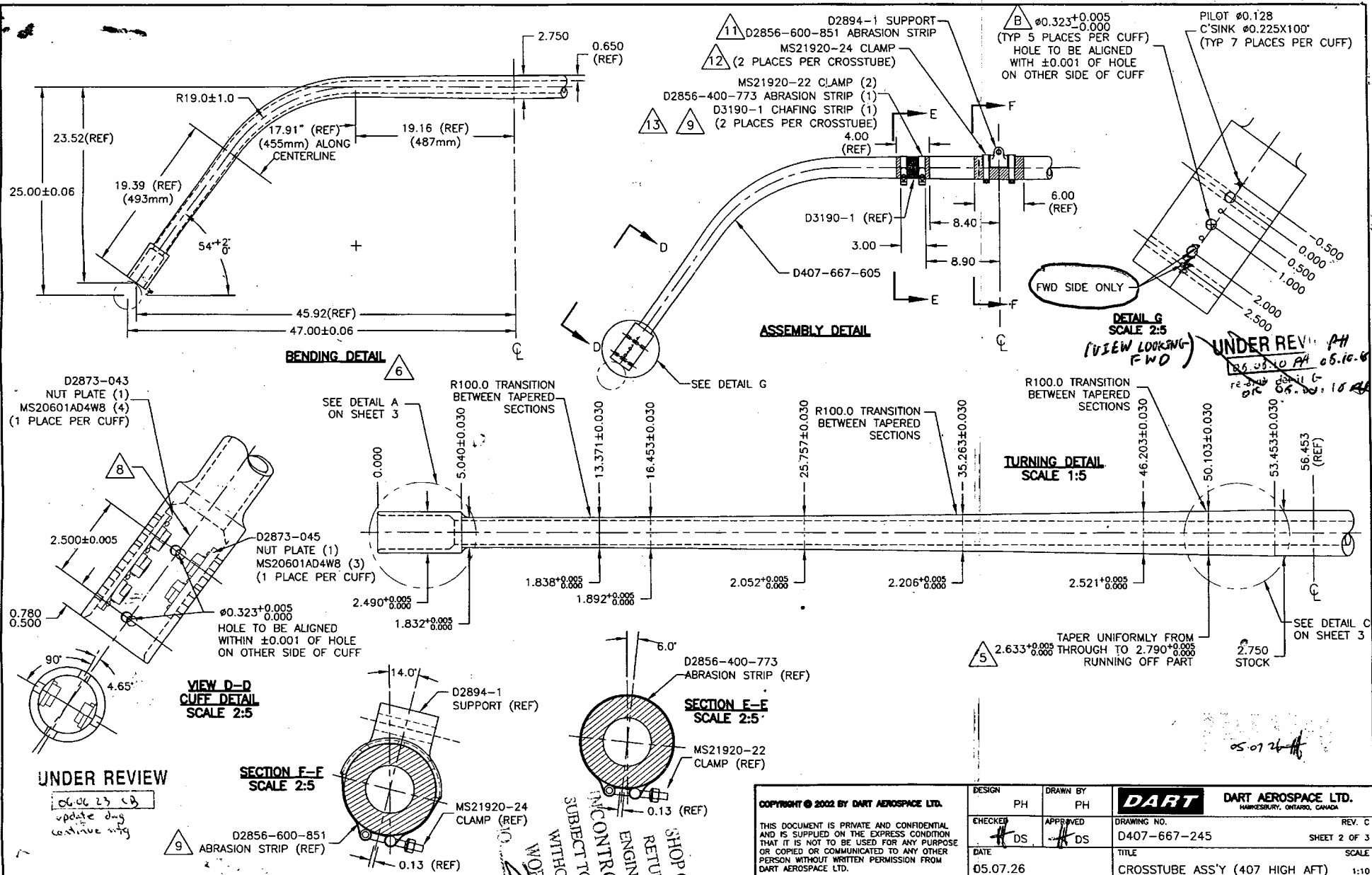
re-plan detail G

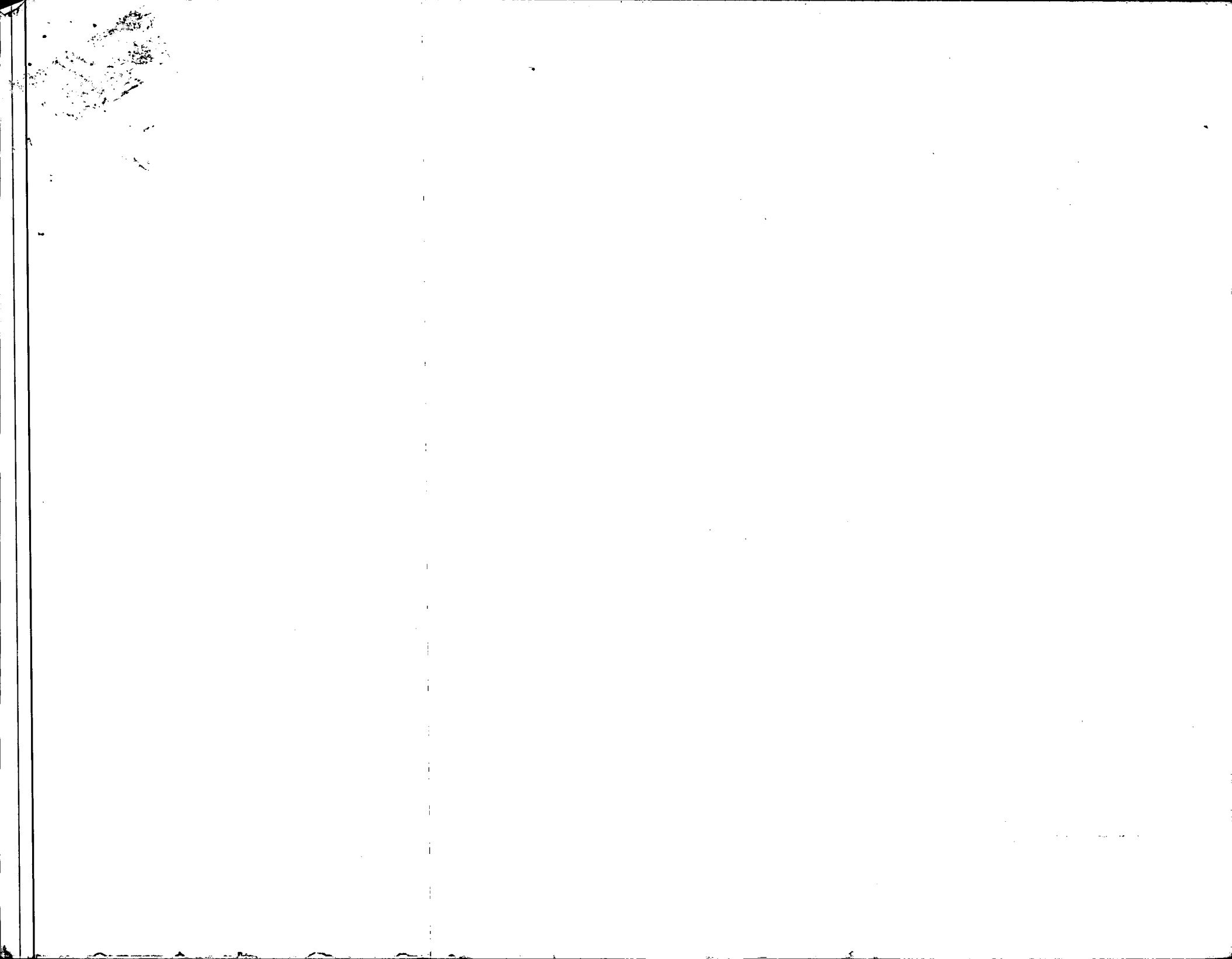
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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
28983

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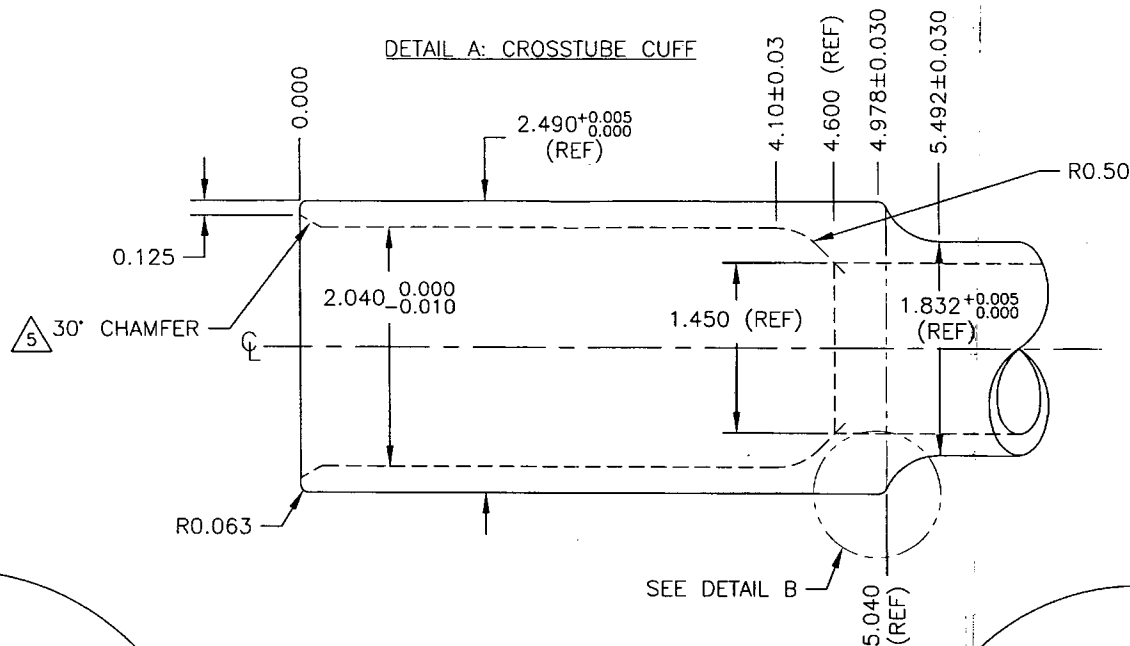
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# DETAIL A: CROSSTUBE CUFF



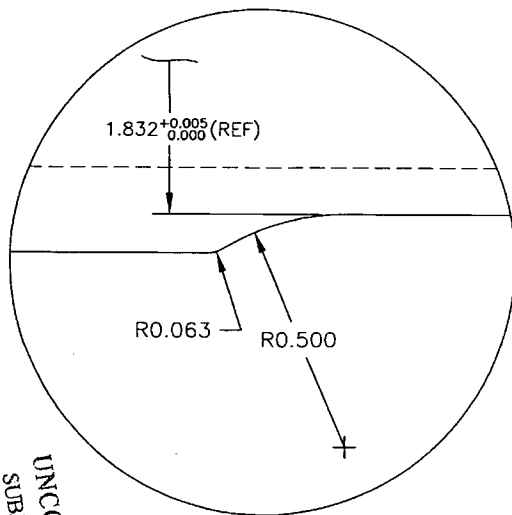
UNDER REVIEW

06.08.10 PH  
re-draw detail B

OK  
06.10.11  
PH

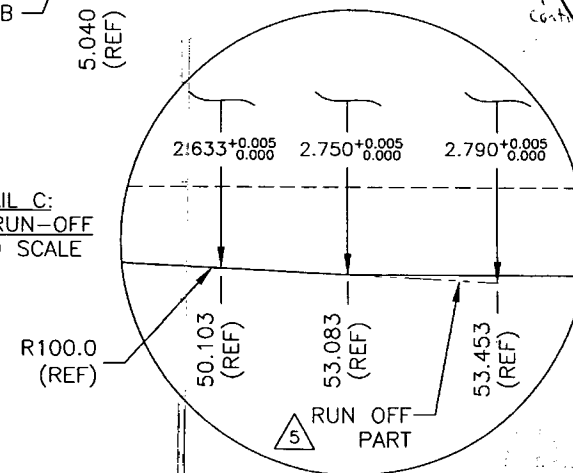
UNDER REVIEW

06.06.23 B  
update dwg  
Continue - sig



DETAIL B: CUFF  
TRANSITION  
SCALE 4:1

DETAIL C:  
TAPER RUN-OFF  
NOT TO SCALE



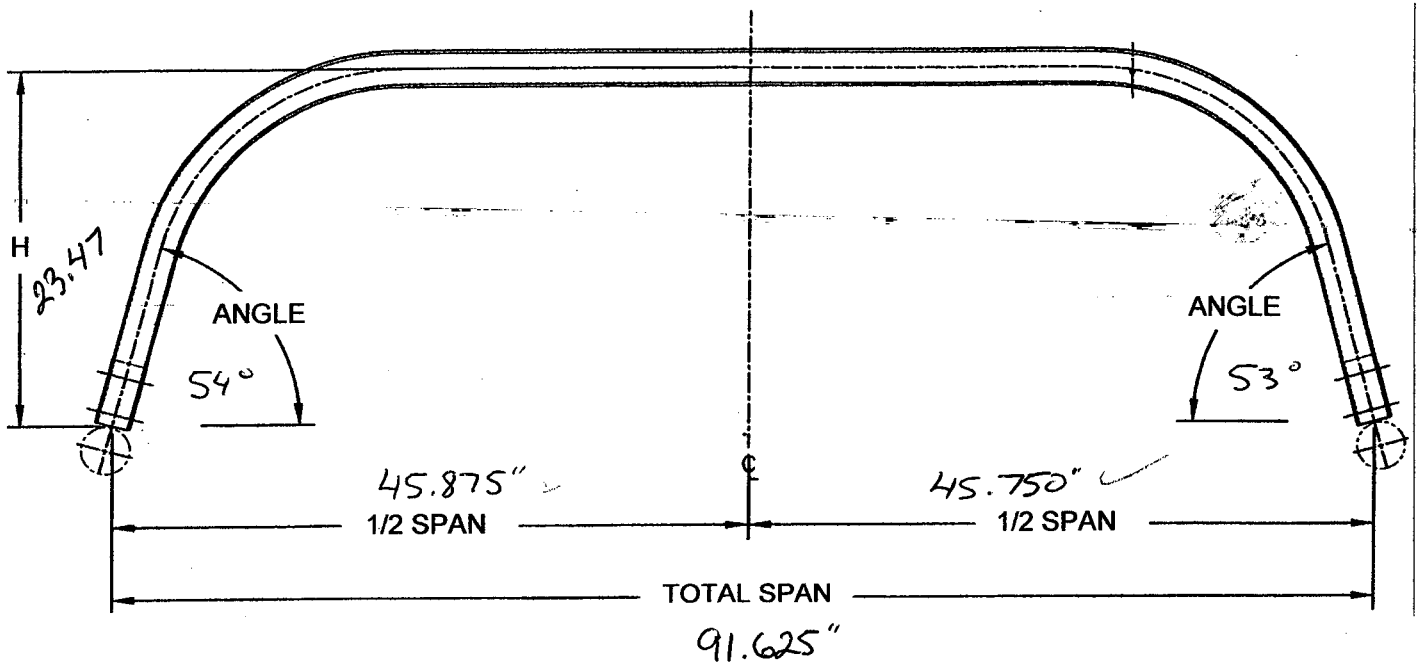
05.07.26

NO. 28983  
WORK ORDER  
WITHOUT NOTICE  
SUBJECT TO AGREEMENT  
UNCONTROLLED COPY  
ENGINEERING  
RETURN TO  
SHOP COPY

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		CHECKED PH	APPROVED PH	D407-667-245	SHEET 3 OF 3
		DATE	TITLE	SCALE	
		05.07.26	CROSSTUBE ASS'Y (407 HIGH AFT)	1:1	



# Crosstube Bend Dimension Sheet



PART NUMBER: A407667205

BATCH NUMBER: 28983

DRAWING: A407667245 REVISION: C

H: 23.52

1/2 SPAN: 45.92

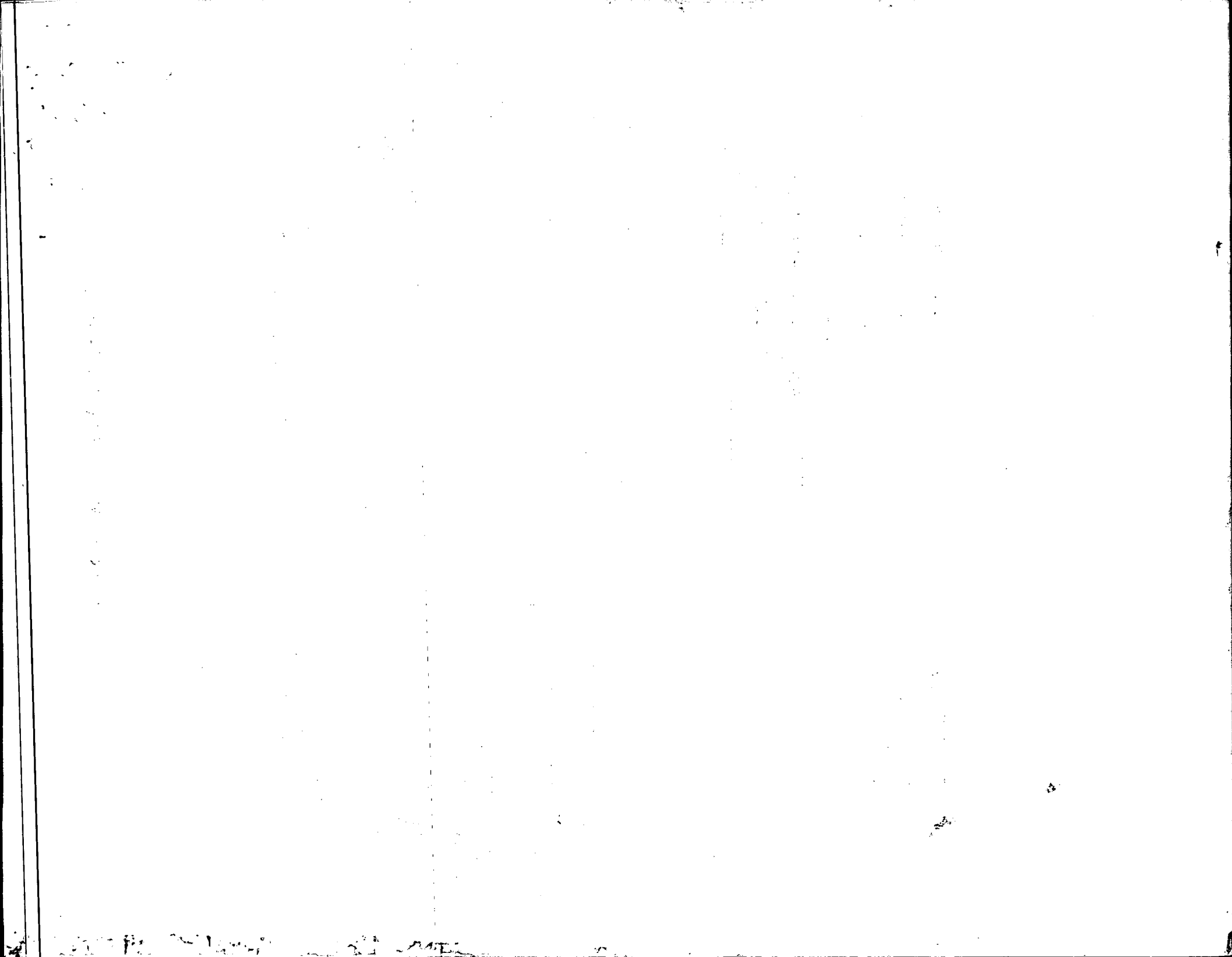
TOTAL SPAN: 91.84

ANGLE: 54°

QC 15: 11

DATE: 07/02/05

QTY: 1





Dant Aerospace

N° DE COMMANDE - ORDER NO.		DÉP. - DEPT.	DATE 07/02/06
VENDU À - SOLD TO		EXPÉDIÉ À - SHIP TO Heath air	
ADRESSE - ADDRESS		ADRESSE - ADDRESS	

DATE D'EXPÉDITION - SHIPPING DATE	VIA	CONDITIONS - TERMS	N° D'ENR. DE TAXE - TAX REG. NO.	VENDEUR - SALESPERSON	Sh	P/N	RESU
	1	D206-667-101 B29099			✓	✓	RE.
	1	D206-667-101 B28680			✓	✓	RE.
	1	D206-667-201 B30316			✓	✓	OK
	1	D206-667-101 B29101			✓	✓	RE.
	1	D206-667-201 B30319			✓	✓	OK
	1	D206-667-101 B26864			✓	✓	OK
	1	D206-667-203 B28979					
	1	D206-667-103 B29627					
	1	D206-667-203 B29633					
	1	D206-667-203 B29634					
	1	D206-667-203 B29635					
	1	D206-667-203 B28977					
	1	D206-667-203 B29632					
	1	D206-667-201 B29098			✓	✓	RE.
	1	D206-667-201 B29096			✓	✓	OK
	1	D206-667-201 B29094					
	1	D206-D407-667-205 B26323			✓	✓	OK
		non destructive test Liquid penetrant inspection as per ASTM 1417 Level 2 Per Q51038					
	↓	D407-667-205 B28983 C.L.			✓	✓	OK
		CERTIFICATE OF CONFORMITY REQD UPON DELIVERY					
			TPS/GST				
			TVP/PST				

59079

SIGNATURE

N° LIC. SEC. NO.

TOTAL

**HeathAir**

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3  
Tél.: (514) 636-1000 • Fax: (514) 636-0031

W.O. N° 35707

A.M.O. Number: 46/90

**NON-DESTRUCTIVE TESTING REPORT****AIRCRAFT / COMPONENT INFORMATION**

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

**INSPECTION REQUIREMENTS**

Carry out FPI of (10) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty (4) P/N D206-667-101 S/N's B29099, B28680, B29101 and B26864.

Qty (4) P/N D206-667-201 S/N's B30316, B30319, B29098 and B29096.

Qty (2) P/N D407-667-205 S/N's B26323 and B28983.

☐ RADIOGRAPHY☐ ULTRASONIC☒ PENETRANT☐ MAGNETIC PARTICLE☐ EDDY CURRENT**INSPECTION REPORT**

Fluorescent penetrant inspection was performed in accordance with the above requirements on (10) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)  
Ardrox 970P25E Batch #04B503.

(10) cross tubes inspected. (6) PASSED / (4) FAILED.

Details: Failed S/N's B29099, B28680, B29101 and B29098.

- tubes are marked at locations requiring rework.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH  
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY: 

DATE February 12, 2007

INSPECTION  
STAMP(S) **CUSTOMER INFORMATION**

CUSTOMER: Dart Aerospace

P.O. NUMBER PO 00003046

ADDRESS:

CONTACT NAME: Linda Lacelle

LABOUR

@

F. (613) 632-1053

\$

MATERIALS

@

TRAVEL EXPENSES

@

GST

HOTEL EXPENSES

@

PST

INVOICE NO.

TOTAL \$

WHITE COPY - INSPECTION FILE • YELLOW COPY - CUSTOMER • PINK COPY - ACCOUNTANT

DESIGN <i>PH</i>	DRAWN BY <i>PH</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED	APPROVED	DRAWING NO. D407-667-245	REV. D SHEET 1 OF 3
DATE 07.02.07		TITLE CROSSTUBE ASS'Y (407 HIGH AFT) NTS	
A	02.05.13	NEW ISSUE	
B	03.05.21	ADD CHAFING SHIELD	
C	05.07.26	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
D	07.02.07	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD-MAGNOBOND-6398,-ADD-CUSHION	

**PRELIMINARY ISSUE**  
*PH 07.02.14*

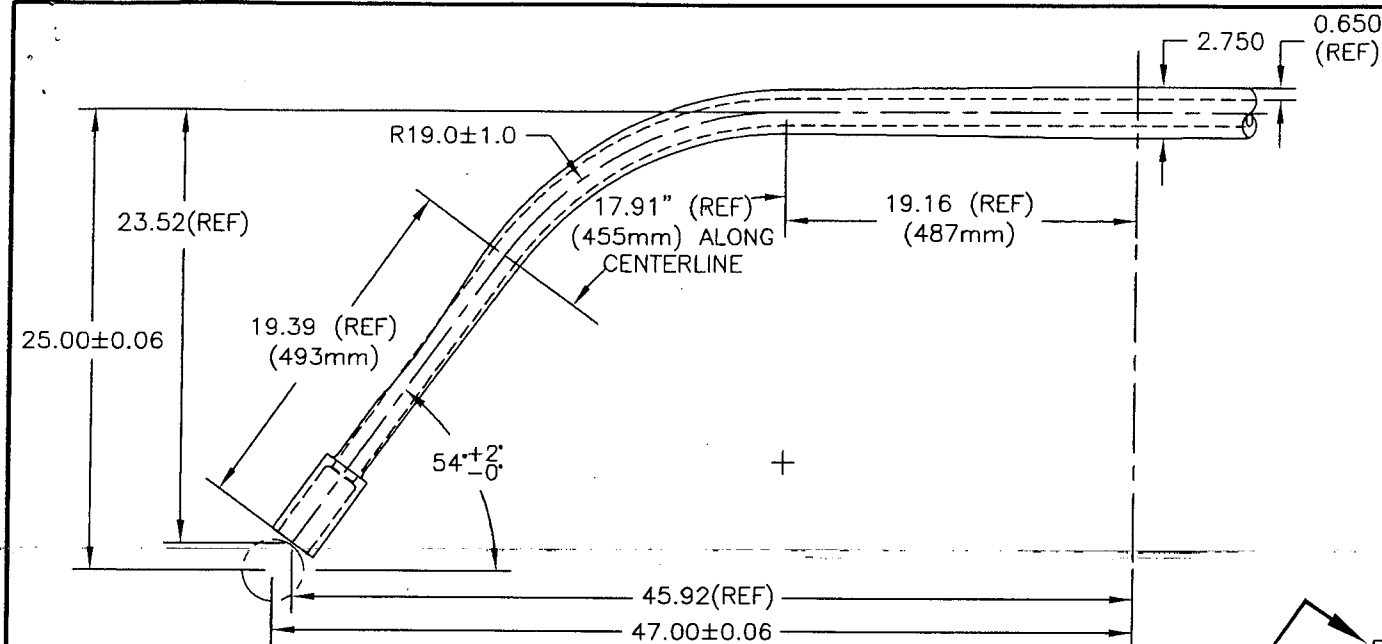
Qty	Part Number	Description
X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	D6011-115	CROSSTUBE
2	D2856-400-773	ABRASION STRIP
2	D2873-043	NUT PLATE
2	D2873-045	NUT PLATE
1	D2894-1	SUPPORT
2	D3190-1	CHAFING SHIELD
2	D3595-075-430	RUBBER CUSHION
14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
4	MS21920-22	CLAMP
2	MS21920-25	CLAMP (OR MS21920-24)

#### GENERAL NOTES:

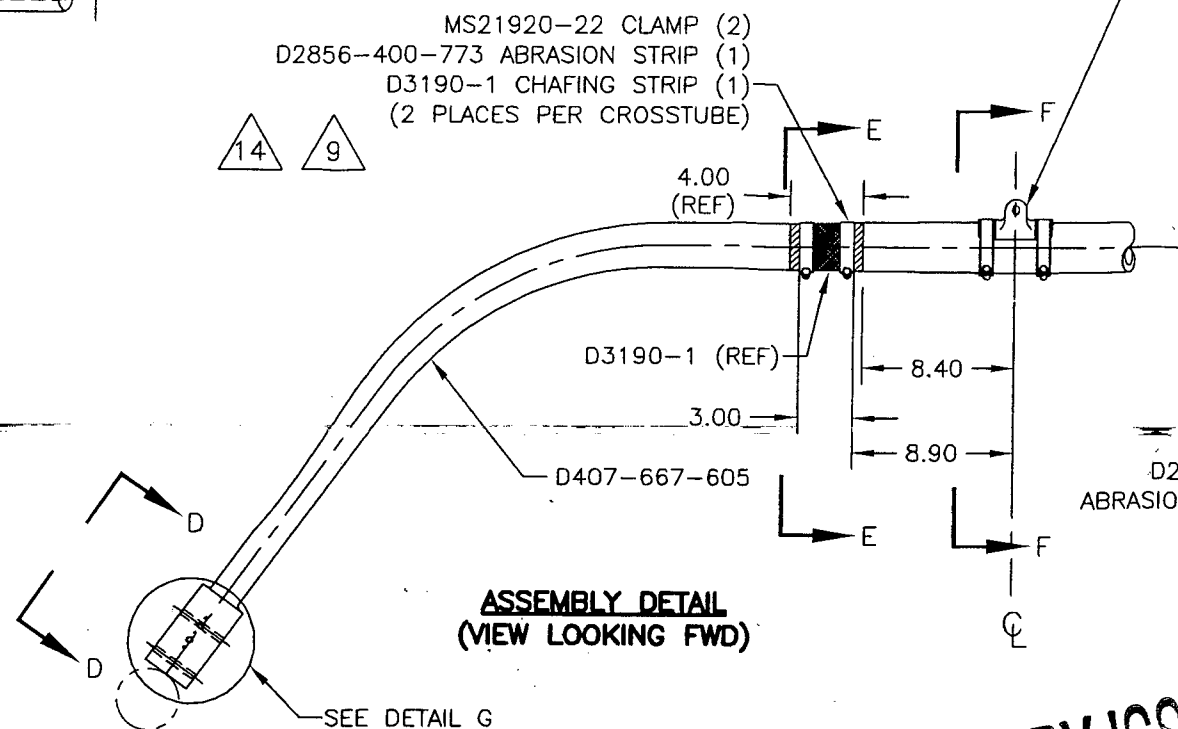
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6011-115  
FINISHED LENGTH = 112.91±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-25 CLAMPS WITH D3595-075-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.  
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.
- 14) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.

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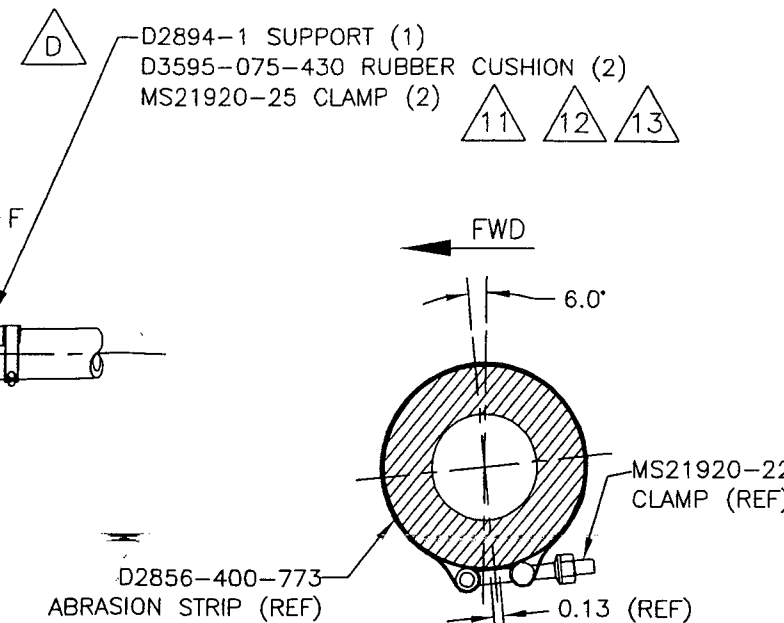
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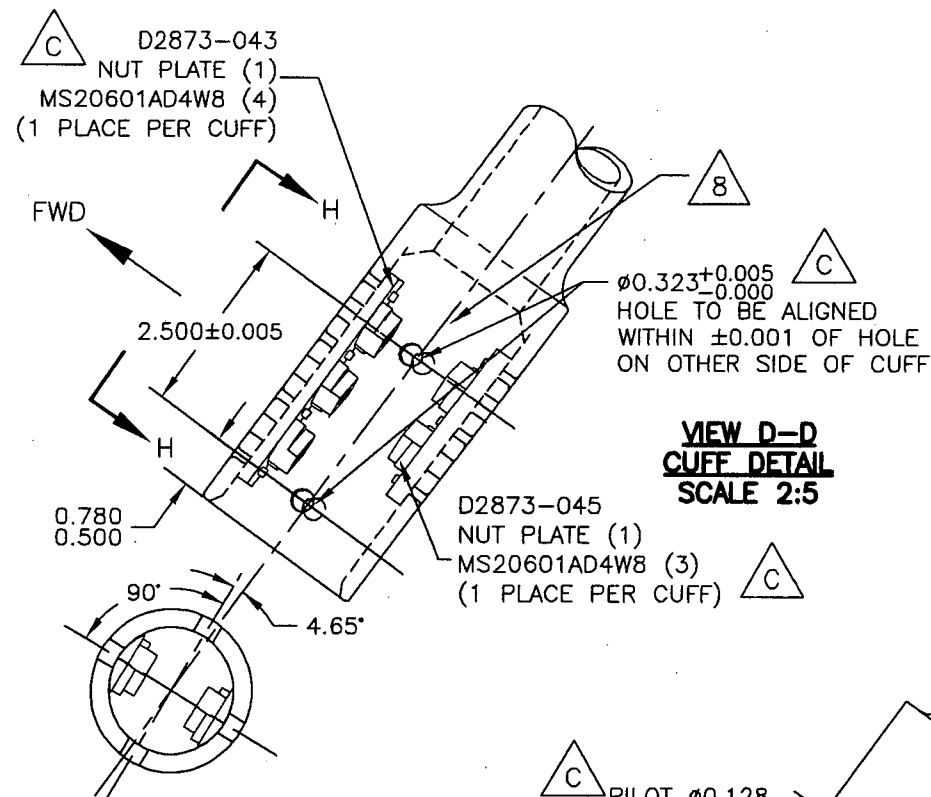
**BENDING DETAIL 6**



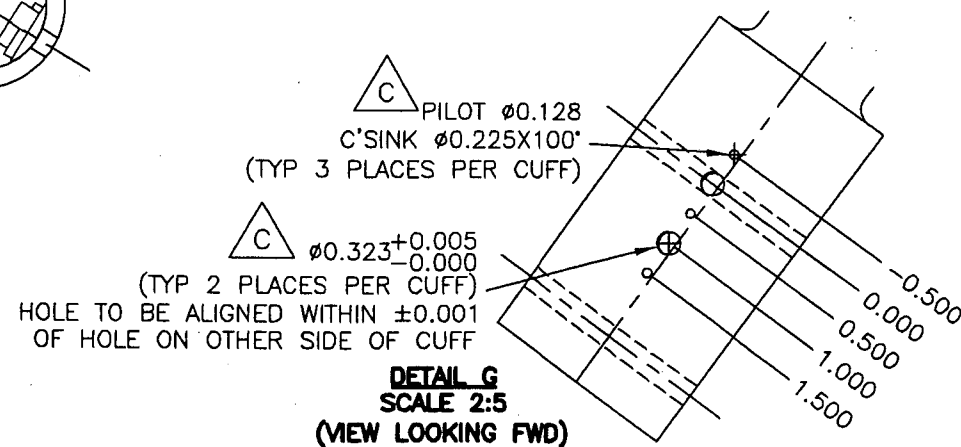
**ASSEMBLY DETAIL  
(VIEW LOOKING FWD)**



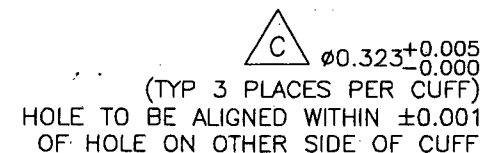
**SECTION E-E  
SCALE 2:5**



**VIEW D-D  
CUFF DETAIL  
SCALE 2:5**

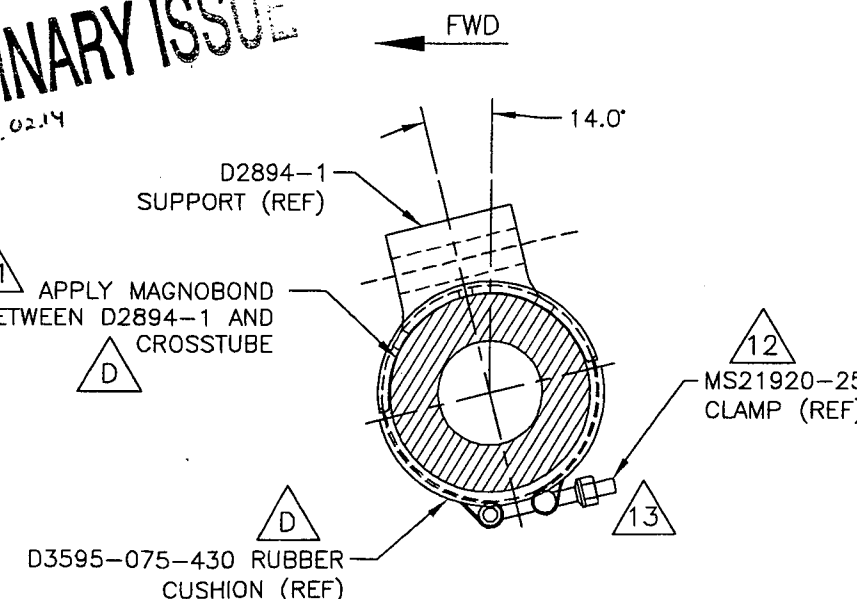


**DETAIL G  
SCALE 2:5  
(VIEW LOOKING FWD)**



**VIEW H-H  
SCALE 2:5  
(VIEW LOOKING AFT, ROTATED)**

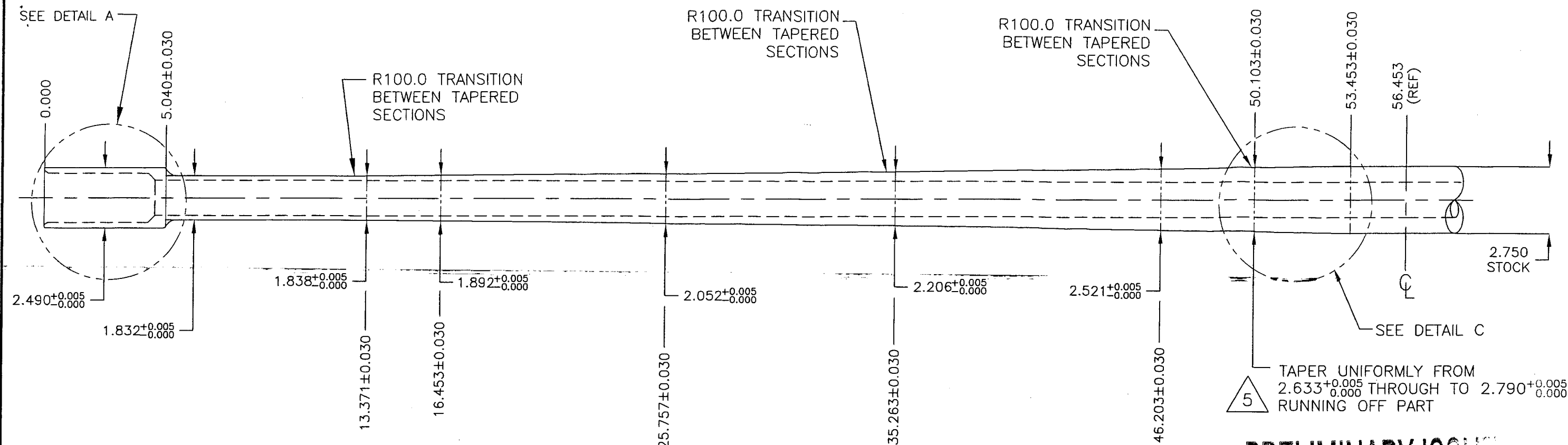
**PRELIMINARY ISSUE**  
PH 07.02.14



**SECTION F-F  
SCALE 2:5**

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DATE 07.02.07		TITLE CROSSTUBE ASS'Y (407 HIGH AFT)		SCALE 1:10	

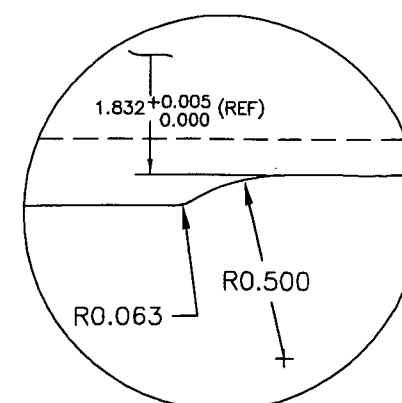
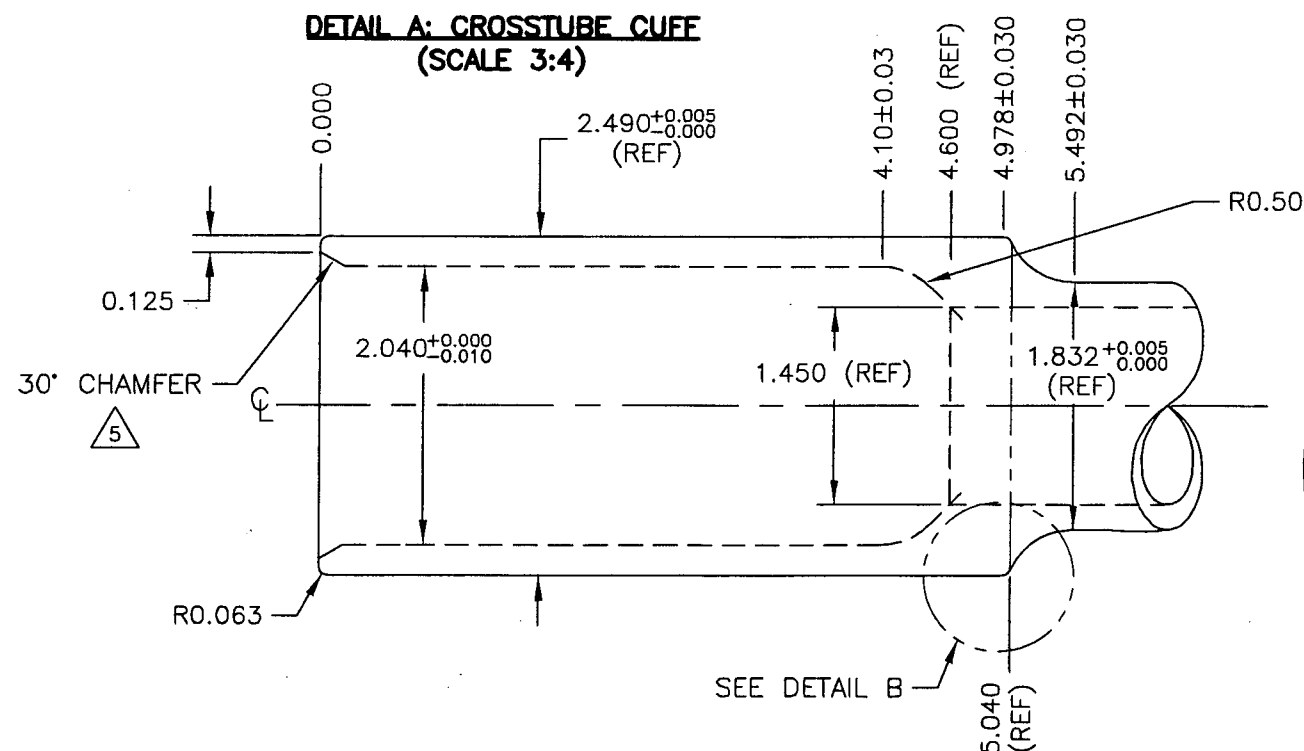




# D407-667-245 MACHINING DETAIL

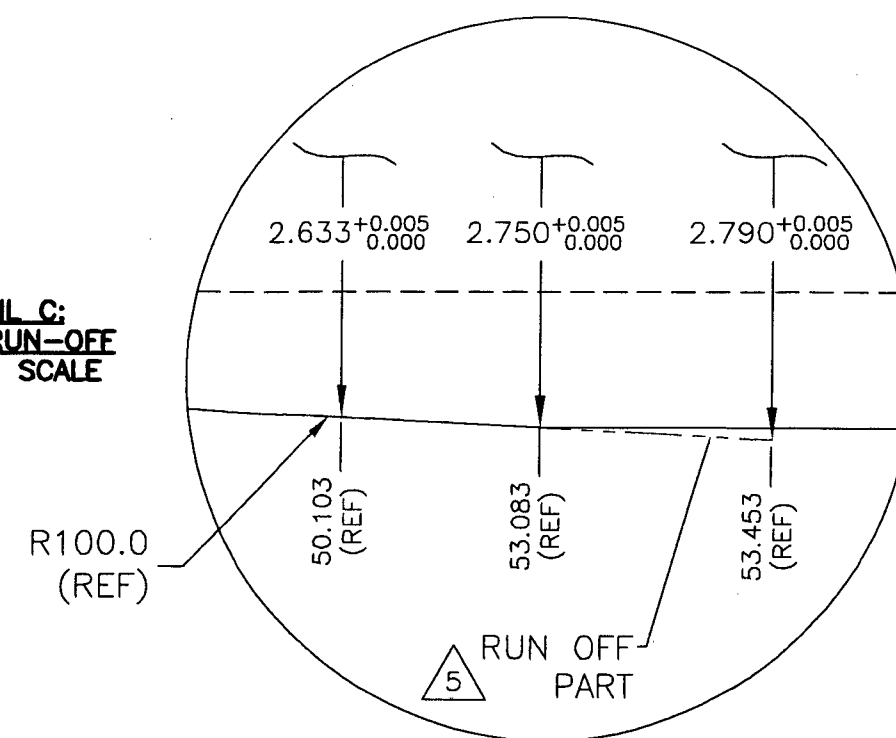
PRELIMINARY ISSUE PH 07.02.14

DETAIL A: CROSSTUBE CUFF (SCALE 3:4)



DETAIL B: CUFF TRANSITION SCALE 2:1

DETAIL C: TAPER RUN-OFF NOT TO SCALE



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CHECKED	APPROVED	DRAWING NO. D407-667-245	REV. D SHEET 3 OF 3
DATE 07.02.07		TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	SCALE 1:4



**PRIMARY ISSUE**

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CHECKED	APPROVED	DRAWING NO. DSI 9366	REV. A SHEET 1 OF 2
DATE 07.02.07		TITLE CROSSTUBE SUPPORT CHANGE	SCALE NTS
A	07.02.07	NEW ISSUE	

## **DART SERVICE INSTRUCTION**

**TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 Rev. C AND  
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D206-667 Rev. 2  
REF. CANADIAN STC: SH01-5  
REF. FAA STC: SR01304NY**

For D407-667-205 Aft Crosstubes at CHG 004 or later, the D2856-600-851 Abrasion Strip has been removed, the center D2894-1 Support has been bonded onto the crosstubes using Magnobond 6398 and D3595-075-430 Rubber Cushions have been installed underneath the MS21920-24/-25 Clamps. Amend Parts List of IIN-D206-667 Section 5 and ICA-D206-667 Section 32.8 as follows:

**Remove:**

Item	QTY -205	Part Number	Description
15	2	D2856-600-851	ABRASION STRIP
18	2	MS21920-24	CLAMP

**Add:**

Item	QTY -205	Part Number	Description
18	2	MS21920-25	CLAMP (OR MS21920-24)
50	2	D3595-075-430	RUBBER CUSHION

**To prevent the center support from shifting on D407-667-205 Crosstubes at CHG 003 or earlier, the D2894-1 Support should be removed and re-installed as follows:**

**Note:** The MS21920-24/-25 clamps are interchangeable to accommodate varying diameters. Ensure there is a minimum of 1.5 threads in safety on the nuts.

- 1) Follow section 32.1 of ICA-D206-667 for the removal of the crosstubes from the helicopter.
- 2) Remove the qty(2) MS21920-24 Clamps from the crosstube that fasten the D2894-1 Supports to the crosstube.
- 3) Remove the D2856-600-851 Abrasion Strip from the crosstube per section 32.5 of ICA-D206-667.
- 4) Inspect the crosstube surface underneath the support for corrosion and mechanical damage per items 5.3.1 and 5.3.2 of the 300 hour inspection. Repair damage within acceptable limits per item 5.3.3 of the 300 hour inspection. Touch up finish per item 5.3.9 of 300 hour inspection.
- 5) Abrade area to which support will be applied with 400 grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe area until there is no residue.
- 6) Apply a 0.03" to 0.06" thick layer of Magnobond 6398 underneath D2894-1 Support and re-install the Support on the crosstube as shown in Figure 1. Use rocker beam assembly to properly align the D2894-1 Support. Ensure the Rocker Beam Assembly can move freely without any friction with other parts. Position and secure the D2894-1 Support on the crosstube using MS21920-24/-25 Clamps. Install a D3595-075-430 Rubber Cushion underneath each MS21920-24/-25 Clamp. Torque clamps 80-100 in-lb. Let the D407-667-205 Crosstube Assembly cure before re-installing the crosstube on the aircraft.
- 7) Re-install the D407-667-205 crosstube per Section 32.2 of ICA-D206-667.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

**APPROVED**

BY: \_\_\_\_\_  
D. SHEPHERD (DE # 02)

DATE: 07.02.07  
CERT. NO.: SH01-5  
ISSUE: 3

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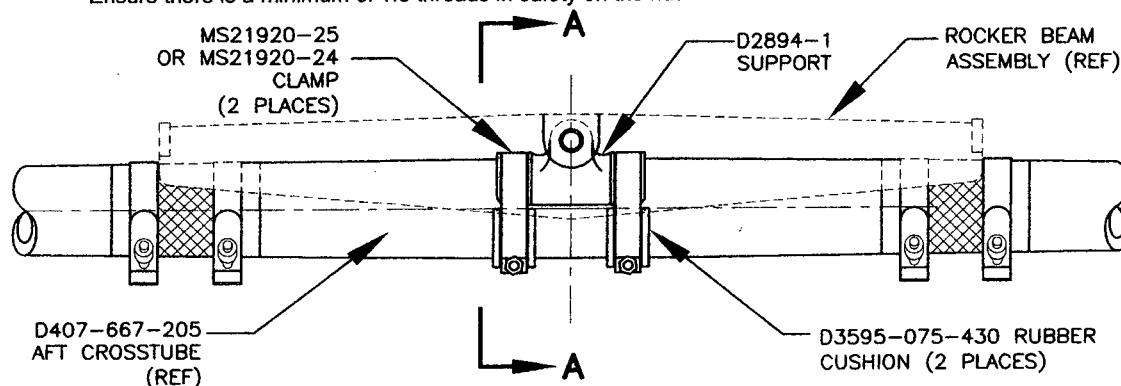
DESIGN <i>PH</i>	DRAWN BY <i>PH</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED	APPROVED	DRAWING NO. DSI 9366	REV. A SHEET 2 OF 2
DATE 07.02.07	TITLE CROSSTUBE SUPPORT CHANGE		SCALE NTS

For customers who would like to upgrade their D407-667-205 Aft Crosstubes from CHG 003 or earlier to CHG 004, the following kit can be obtained from Dart:

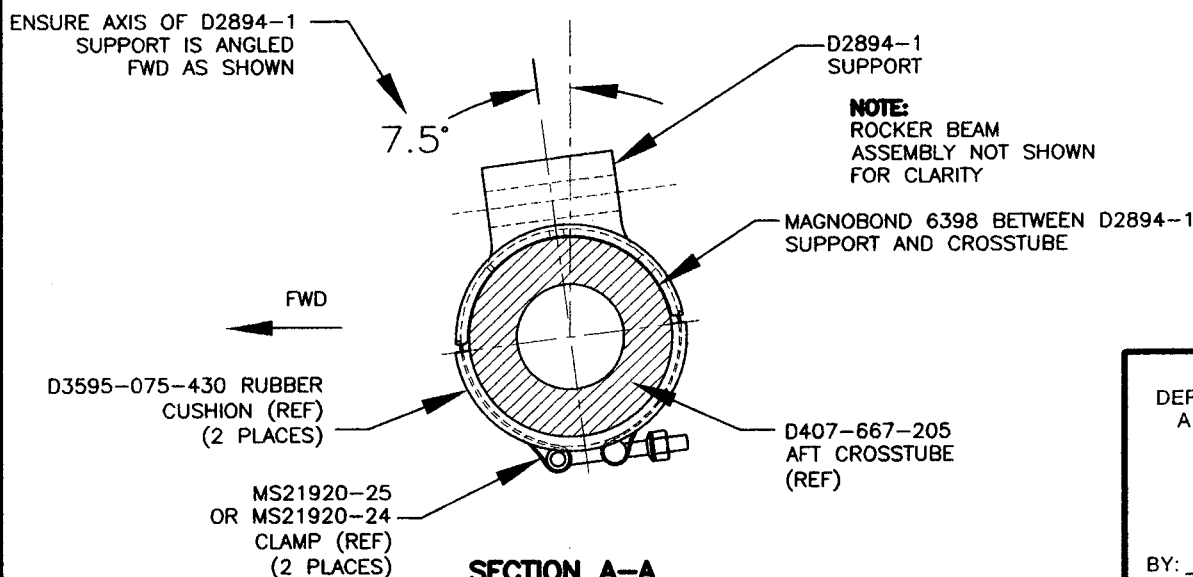
#### DSI 9366-011 PARTS LIST

QTY -011	Part Number	Description
X	DSI 9366-011	CROSSTUBE SUPPORT CHANGE
2	D3595-075-430	RUBBER CUSHION
2	MS21920-25	CLAMP (OR MS21920-24)

**Note:** The MS21920-24/-25 clamps are interchangeable to accommodate varying diameters. Ensure there is a minimum of 1.5 threads in safety on the nut.



**FIGURE 1 - CROSSTUBE SUPPORT  
INSTALLATION ON D407-667-205**



**SECTION A-A**  
INSTALLATION SHOWN WITH  
CROSSTUBE INSTALLED ONTO  
SKIDTUBE

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

**APPROVED**

BY: \_\_\_\_\_  
D. SHEPHERD (DE # 02)

DATE: 07.02.07  
CERT. NO.: SH01-5  
ISSUE: 3

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